



REQUEST FOR ACTION (RFA) RESPONSE

GLAST LAT Project
Calorimeter Peer Review

17 – 18 March 2003

Action Item:	CAL – 025
Presentation Section:	Calibration
Submitted by:	Tune Kamae

Request: CAL calibration - How can you calibrate CAL in MeV-GeV using heavy ion if fast shaper outputs are not recorded? Can you separate alpha, carbon, nitrogen, oxygen by other info?

**Reason /
Comment:**

Response: 4 April 2003

The calibration on heavy ions is independent of the fast-shaper output. The fast shaper only provides an auxiliary trigger for the CAL (and thereby LAT) and is not required in any way for this calibration process. The calibration relies on well-defined tracks derived from good TKR triggers. From these well-defined tracks, we will select only penetrating galactic cosmic rays, and trivially make corrections for the pathlengths of heavy ions through the CDEs. With these corrections for pathlength -- and the approximate calibrations of CDEs from sea-level muons and charge-injection processes -- the energy deposited per unit pathlength (dE/dx) by each heavy ion can be measured. Because the expected energy deposition and elemental composition of the galactic cosmic rays is well understood, the species of each heavy ion can be identified. No independent measure of charge is required. This was demonstrated with the BTEM at GSI in the summer of 2000. Only the most common GCR species (He, C, O, Ne, Mg, Si, Fe) are required for the calibration, since they give more than adequate coverage of the overlapping gain ranges. This further simplifies the analysis, by allowing us to neglect, e.g., the potentially confusing, low-abundance species of the sub-Fe region.